



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/593,870

07/31/2007

Kun'ichi Miyazawa

2006\_1609A

4399

513 7590 11/10/2010  
WENDEROTH, LIND & PONACK, L.L.P.  
1030 15th Street, N.W.,  
Suite 400 East  
Washington, DC 20005-1503

EXAMINER

MCCRACKEN, DANIEL

ART UNIT

PAPER NUMBER

1736

NOTIFICATION DATE

DELIVERY MODE

11/10/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ddalecki@wenderoth.com  
coa@wenderoth.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/593,870	<b>Applicant(s)</b> MIYAZAWA ET AL.	
	<b>Examiner</b> DANIEL C. MCCracken	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 10-12, 14 and 16-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-12, 14 and 16-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

Citation to the Specification will be in the following format: (S. # : ¶/L) where # denotes the page number and ¶/L denotes the paragraph number or line number. Citation to patent literature will be in the form (Inventor # : LL) where # is the column number and LL is the line number. Citation to the pre-grant publication literature will be in the following format (Inventor # : ¶) where # denotes the page number and ¶ denotes the paragraph number.

### ***Status of Application***

The response dated 8/23/2010 has been received and will be entered. Claims 10-12, 14, and 16-28 are pending. Claims 10-12, 14, and 16-21 are currently amended. Claims 22-28 are new. Claims 1-9, 13, and 15 are acknowledged as cancelled.

### ***Response to Arguments***

#### **Drawings**

I. The objection to the drawings is WITHDRAWN in light of the substitute drawings submitted with the latest response.

#### **Claim Rejections – 35 U.S.C. §103**

I. With respect to the rejection of Claims 10-21 under 35 U.S.C. 103(a) as being unpatentable over US 2002/0192143 to Miyazawa, et al. in view of Fagan, et al., *Metal Complexes of Buckminsterfullerene (C<sub>60</sub>)*, Acc. Chem. Res. 1992; 25: 134-142 (hereinafter “Fagan at \_\_\_”), the traversal is on the grounds that “the hollow needle-like fullerene crystals

Art Unit: 1793

taught by the reference are **polycrystalline**, rather than “**single** crystalline”, as recited in claims 10, 11, 17 and 18.” (Remarks of 8/23/2010 at 6) (emphasis in original). The remarks go on to state non-patent documents were provided and that these somehow prove that the fullerene needles of the Miyazawa PG PUB are not single crystalline. *See generally* (Remarks of 8/23/2010 at 7). These arguments appear premised on the fact that the first Miyazawa reference, "Structure and properties of fullerene nanowhiskers prepared by the liquid-liquid interfacial precipitation method," has the same micrograph as the Miyazawa PG PUB, and that “one can clearly see that the hollow needle-like fullerene crystals are polycrystalline.” *Id.* This is not clear to the Examiner, especially because the Miyazawa PG PUB states that “the resulting solution deposits a **single wire-like crystal** of the fullerene (a fullerene wire) having crystal habit.” (Miyazawa 1: [0020]) (emphasis added). Note also paragraphs [0022]-[0023] which are reproduced below:

[0022] The term "wire" as used herein means "fine wire" and the term "a fine carbon wire" means "a wire including carbon as its component". Such fine carbon wires include needle-like crystals (**inclusive of needle-like single crystals** and needle-like polycrystals) each including a fullerene.

[0023] Fine carbon wires each including a fullerene in the form of a needle-like crystal are referred to as "fullerene wires" or "fullerene whiskers". The term "fullerene wires" means and includes fine carbon wires mainly **including wire-like single fullerene crystal having crystal habit**. The term "fullerene whiskers" means and includes fine carbon wires **including a wire-like single fullerene crystal**, and needle-like single crystals and needle-like polycrystals of a fullerene.

(Miyazawa 1: [0022] - 2: [0023]) (emphasis added). Miyazawa teaches single-crystalline fullerene needles/wires. The remarks in the response appear to contradict Applicants own prior patent application. This contradiction/distinction is not understood and not persuasive.

Art Unit: 1793

Similar remarks are made with respect to the second and third Miyazawa references, both concluding with the statement that “one can clearly see that the needle crystal is ‘single crystalline.’” (Remarks of 8/23/2010 at 7). These are conclusory statements. What facts are these based on? This evidence was not developed, nor was it presented in affidavit/declaration format. Furthermore, how is presenting a separate document that says the same thing as the specification (which is what the remarks did) probative to the rejection over the prior art? This was not understood. The rejection is MAINTAINED, updated to address claim amendments.

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

**I. Claims 10-12, 14, 16-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0192143 to Miyazawa, et al. in view of Fagan, et al., *Metal Complexes of Buckminsterfullerene (C<sub>60</sub>)*, Acc. Chem. Res. 1992; 25: 134-142 (hereinafter “Fagan at \_\_”).**

With respect to Claim 17-18, Miyazawa teaches a method for making “needle crystals” via a liquid-liquid interface method. *See generally* (Miyazawa 6: [0151] *et seq.*). The “needle crystals” can be single crystalline. (Miyazawa 1: [0022] - 2: [0023]). Note with respect to Claims 20-21 that both toluene (Miyazawa 7: [0163]) and isopropyl alcohol (Miyazawa 7: [0174]) are taught. Claims 17-19 differ from Miyazawa in that they require a C<sub>60</sub> platinum derivative, not taught by Miyazawa. This however does not impart patentability. Note the teachings of Miyazawa suggesting that different fullerenes can be added to the needle/wire (Miyazawa 5: [0111]) and that dopants can be added to improve properties of the needle (Miyazawa 6: [0141] *et seq.*). C<sub>60</sub> platinum derivatives, including the specific species of Claim

Art Unit: 1793

19 are known in the art. *See e.g.* (Fagan at 138, col. 1) (note that  $C_6H_5 = Ph$ ). Substitution of the derivatives of Fagan for the fullerenes taught by Miyazawa is an obvious expedient, the articulated rationale being that it would appear to be application of a known method (Miyazawa's liquid-liquid interface precipitation method) to a known product/composition (the fullerene derivative of Fagan), ready for improvement (note the suggestion of improving properties by adding dopants/fullerens) to yield predictable results. *See* MPEP 2143. Furthermore, note the advantages in Fagan related to controlling the reactivity of  $C_{60}$  by adding the Pt moieties. (Fagan at 141, col. 2).

Claims 10-12, 14, 16, and 22-24 are claims directed to the resulting product of the reactions addressed above in connection with Claims 17-21. Note that the morphologies in Claims 12 and 14 are taught. (Miyazawa 5: [0132] *et seq.*) ("hollow portions") *and e.g.* (Miyazawa "Fig 28") (showing a closed form). Note that with respect to Claim 22, polycrystalline or amorphous structures are taught. (Miyazawa 1: [0022] - 2: [0023]). As to Claims 10, 11, and 16, see the Fagan reference and discussion *supra* related to platinum.

**II. Claims 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0192143 to Miyazawa, et al. and Fagan, et al., *Metal Complexes of Buckminsterfullerene ( $C_{60}$ )*, Acc. Chem. Res. 1992; 25: 134-142 as applied to claims 17-18 above, and further in view of US 7,291,318 to Sakurabayashi, et al.**

Claim 25 repeats many limitations addressed in connection with Claims 17-21. The discussion accompanying "Rejection I" is incorporated herein by reference and relied on for steps (1)-(3) of Claim 25. Claim 25 further requires "(4) a step in which a vacuum thermal treatment at 600°C or higher or an irradiation of an electron beam with high energy of 100 keV or higher is carried out for the carbon fine wire." Miyazawa does not appear to recite the

Art Unit: 1793

annealing or irradiation required by the claim. However, Sakurabayashi teaches that e-beam irradiation at the energies claimed. (Sakurabayashi 6: 8 *et seq.*). One would be motivated to employ such a treatment for any number of reasons, for example making nanotubes from “hybrid structures” (which appear to encompass the fullerene wires of Miyazawa). *See e.g.* (Miyazawa 4: 7 *et seq.*). As to Claims 26-28, see discussion of Claims 17-21 accompanying “Rejection I” *supra*.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL C. MCCracken whose telephone number is (571)272-6537. The examiner can normally be reached on Monday through Friday, 9 AM - 6 PM EST.

Art Unit: 1793

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley S. Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel C. McCracken/  
Daniel C. McCracken  
Examiner, Art Unit 1736  
DCM

/Stanley S. Silverman/  
SPE, Art Unit 1736